BULLETIN NO. 1020

RIVETT 1020S

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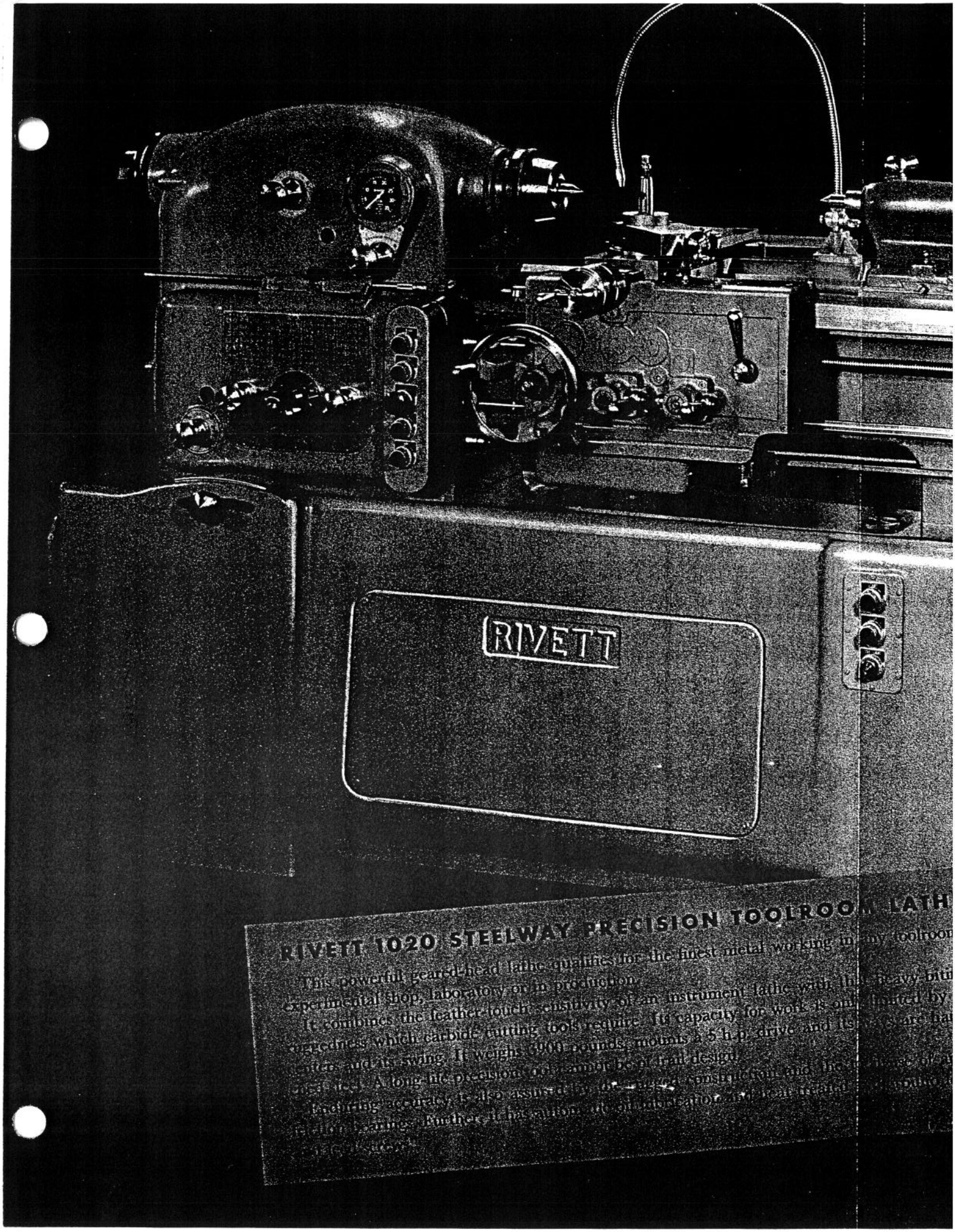
precision toolroom lathe

A SYMBOL OF ACCURACY IN MACHINE TOOLS

RIVETT LATHE & GRINDER, Inc.



RIVETT 1020 STEELWAY PRECISION TOOLROOM LATH

This powerful, geared-head lathe qualifies for the finest metal working in my toolroom experimental shop, laboratory or in production.

It combines the feather-touch sensitivity of an instrument lathe with the heavy-duti ruggedness which carbide cutting tools require. Its capacity for work is on limited by cutter and its swing. It weighs 4900 pounds, mounts a 5 h.p. drive and its are ha on steel. A long-life precision of example be of trail design.

Finishing accuracy is also assured by the rugged construction and the of al tion bearings. Further, it has various other refinements not found

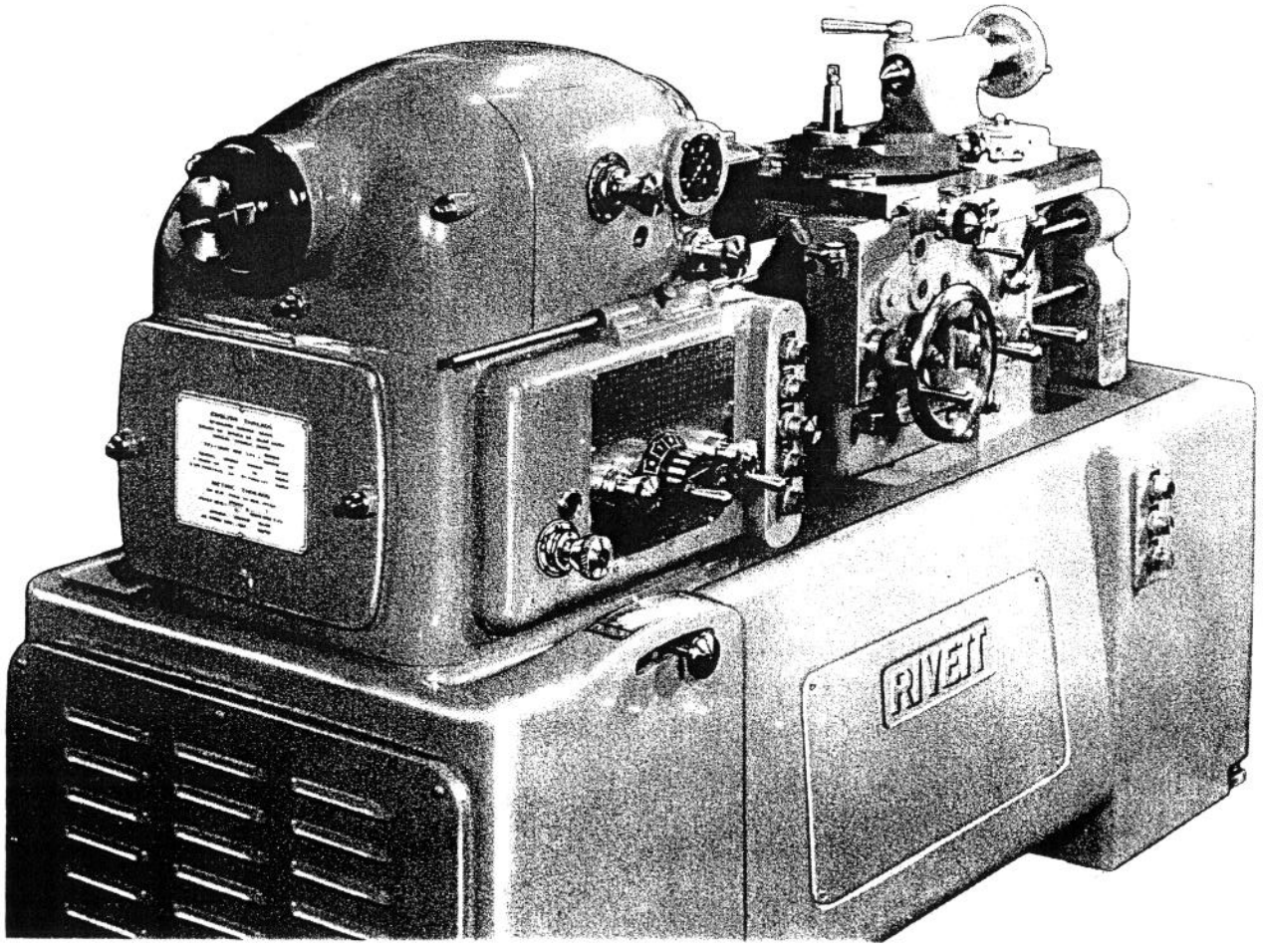
More Precision Work

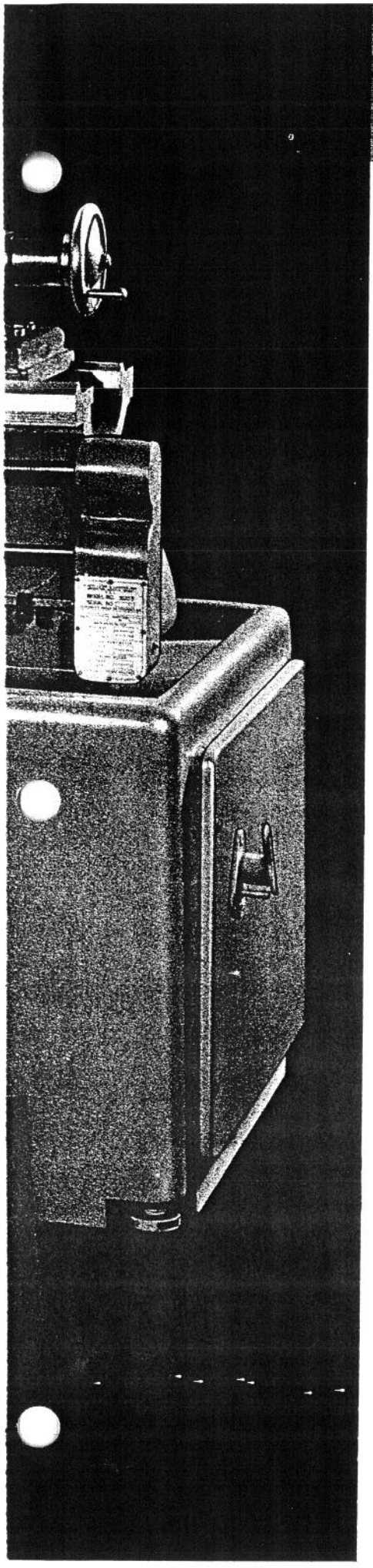
For 69 YEARS A RIVETT PLEDGE

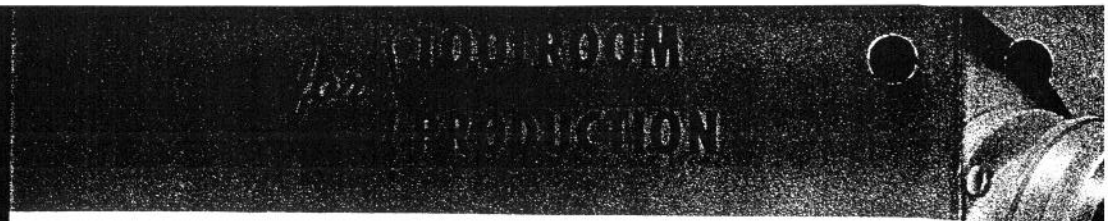
For 69 years our company has designed and built bench, cabinet and now full-grown lathes pledged to "More Precision Work."

The newest and most modern Rivett 1020S Precision Toolroom Lathe is such a machine capable of increased production within closer limits.

In this bulletin "The Rivett 1020 Steelway Precision Toolroom Lathe" presents itself to your friendly and critical attention. See how it may pay for itself within a year by doing more precision work at half the labor cost and saving floor space. Its initial price is reduced by the salvage value of the equipment it supplants. It is one of the world's best investments.

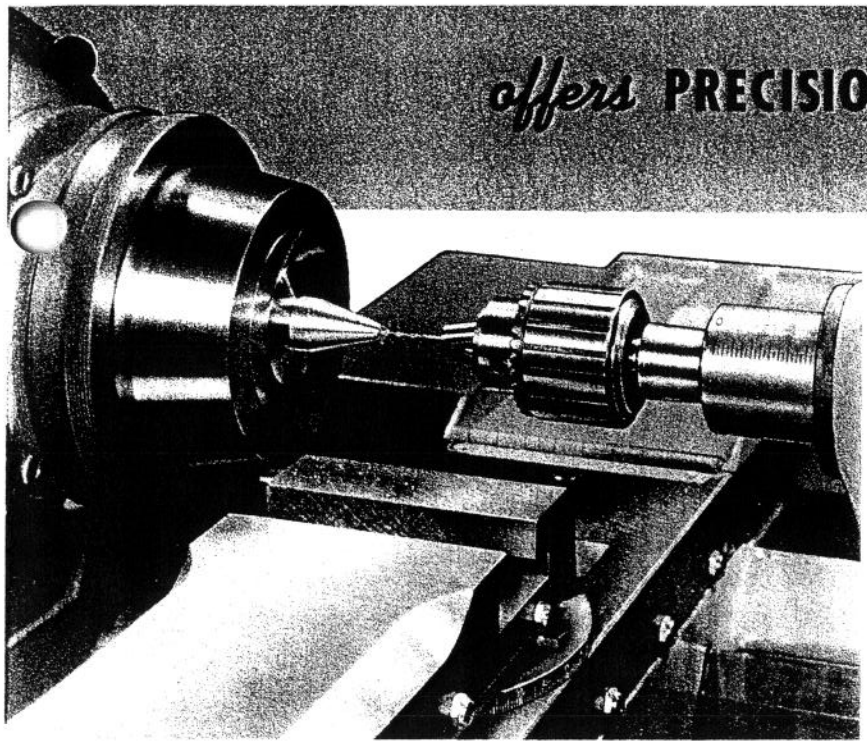






- **Steelway Bed** with inserted steel ways uniformly hardened to 60 Rockwell C Scale.
- **Turning Power** through headstock back gearing at low spindle speeds.
- **Free Spindle** by direct belt drive with no gearing engaged.
- **Infinite Spindle Speeds** through smooth, vee-belt, mechanical transmission.
- **Push Button Control** for speed changing and complete operation.
- **Neutral Clutch** for stopping spindle without stopping drive.
- **Three-Bearing Spindle Mount** to prevent spindle deflection.
- **Collets in Spindle** without adapter for perfect running truth.
- **Handwheel** for convenient turning of headstock spindle.
- **Spindle Index** for multiple threads.
- **Gear Box** for 72 feeds and 84 threads including every world standard from 2 to 240 per inch.
- **Ground Feed Screws** for lasting accuracy.
- **Unit Assemblies** to simplify service and repair.
- **Anti-Friction Bearings** without exception.
- **Automatic Lubrication** or grease sealed bearings throughout.

offers PRECISION, SPEED and POWER



SENSITIVE AS AN INSTRUMENT LATHE

Although the 1020S weighs 3900 pounds, has 12½″ swing and 20″ center distance, it responds to the lightest touch of the operator. Small work accurately held in collets can be driven at any required speed completely free from vibration. The beautifully balanced carriage affords sensitive tool control.

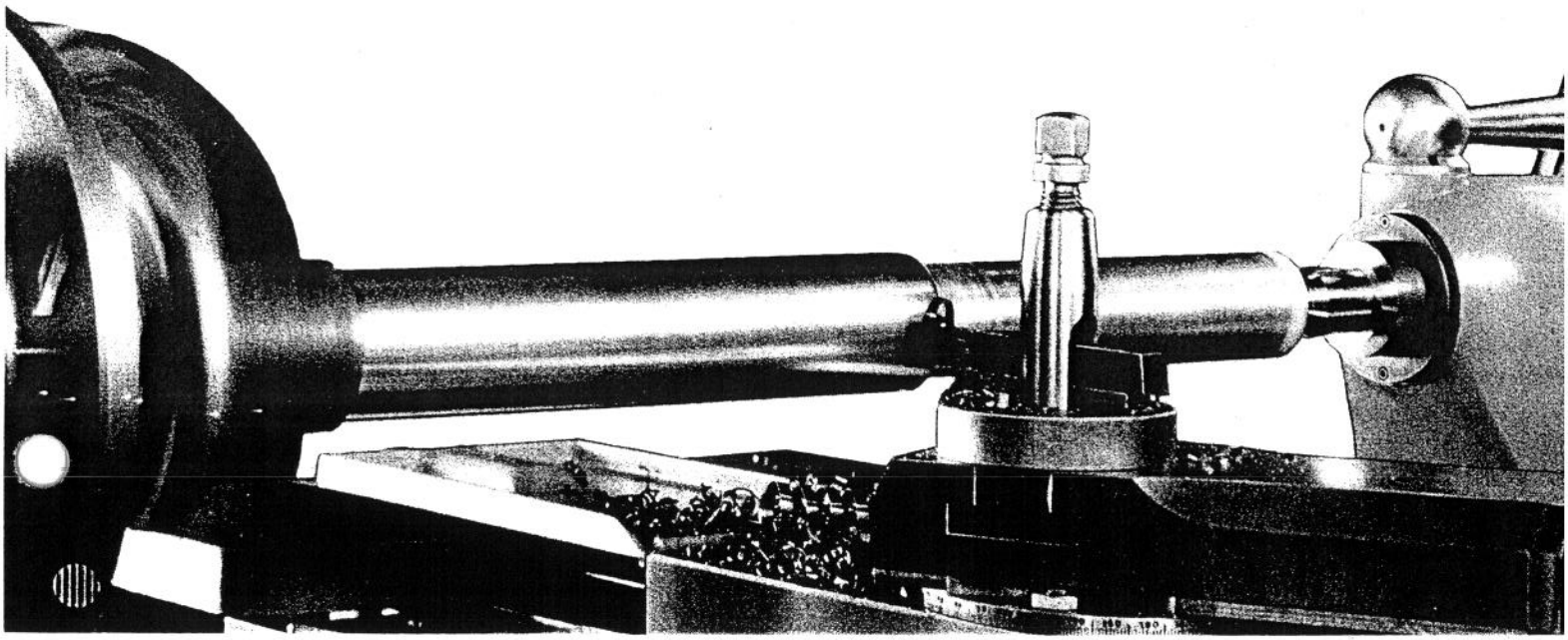
Every 1020S lathe is guaranteed to turn, bore, face and thread within the most exacting tolerances.

POWERFUL AS A LARGE ENGINE LATHE

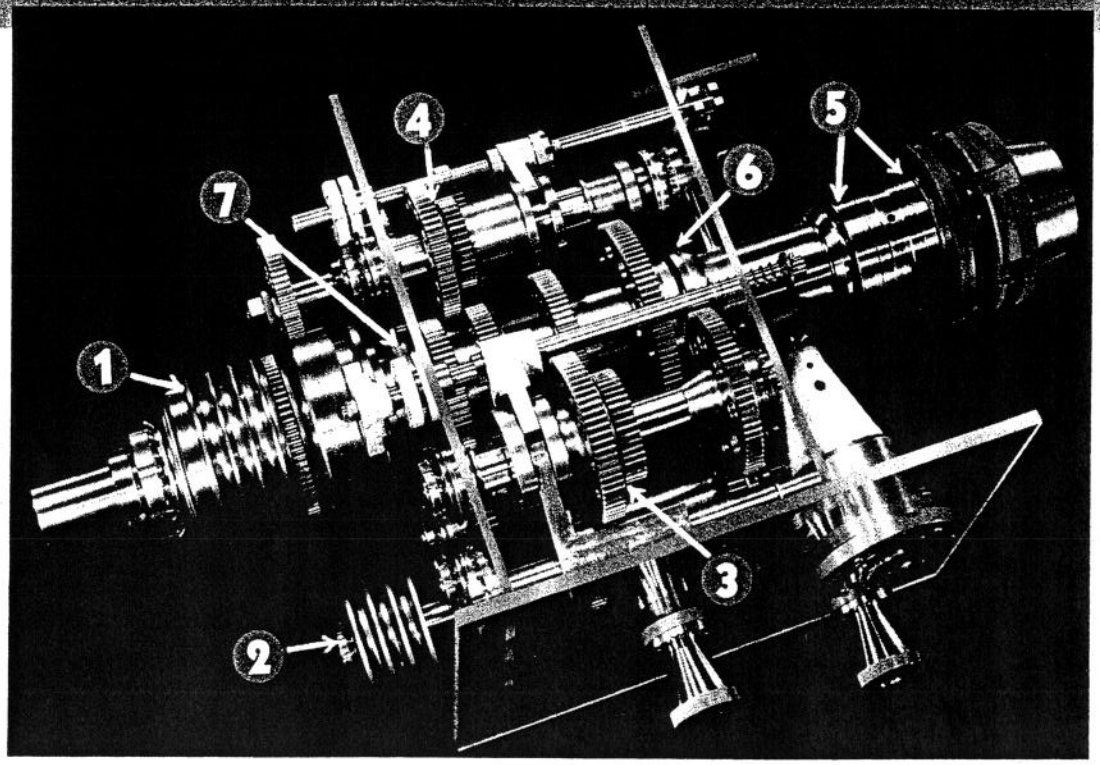
Full horsepower of the main drive motor can be transmitted to the spindle in the lower speed range; see graph on page 5. This is effected by back gearing in the headstock and by vee belts always running at efficient driving speeds — a most important factor.

Large work can be gripped in jaw chuck, strapped to face plate or mounted on centers and turned with coarse feed. A ¼″ chip with .020″ feed on cold rolled steel is well within the capacity of this remarkable machine.

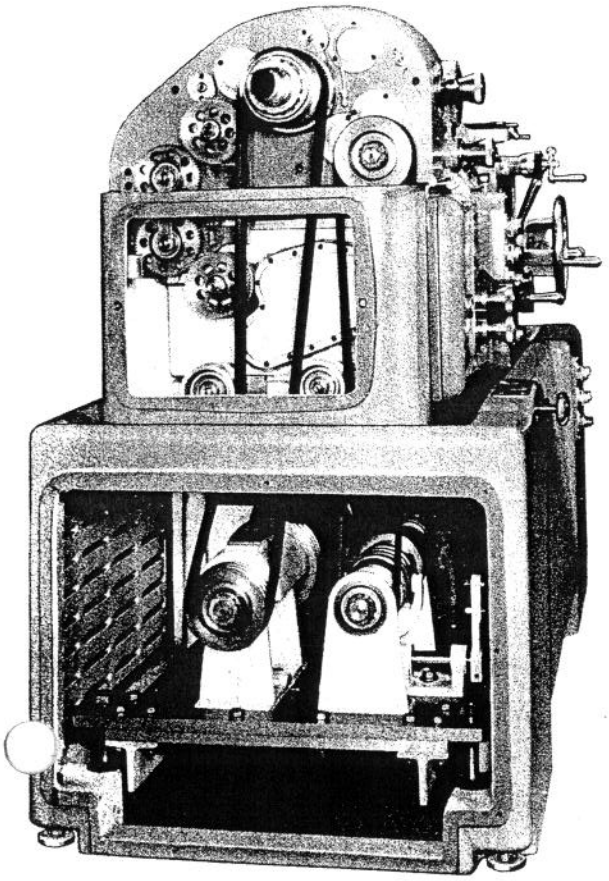
If it can swing it, it will turn it! Work does not have to be selected for the 1020S.



TURNING POWER AT THE SPINDLE



1. Open belt input sheave with engaging clutch open.
2. Back gear input sheave.
3. Back gears for high and low range positioned in neutral.
4. Gear box driving gears for power feed and threading positioned in neutral.
5. Double-row preloaded ball bearings with spacer.
6. Single-row intermediate supporting ball bearing.
7. Single-row rear supporting ball bearing.



POWER FOR ANY JOB

The 1020S in many instances will replace a precision instrument lathe and a heavier engine-toolroom lathe and, with one able operator, do the work of both.

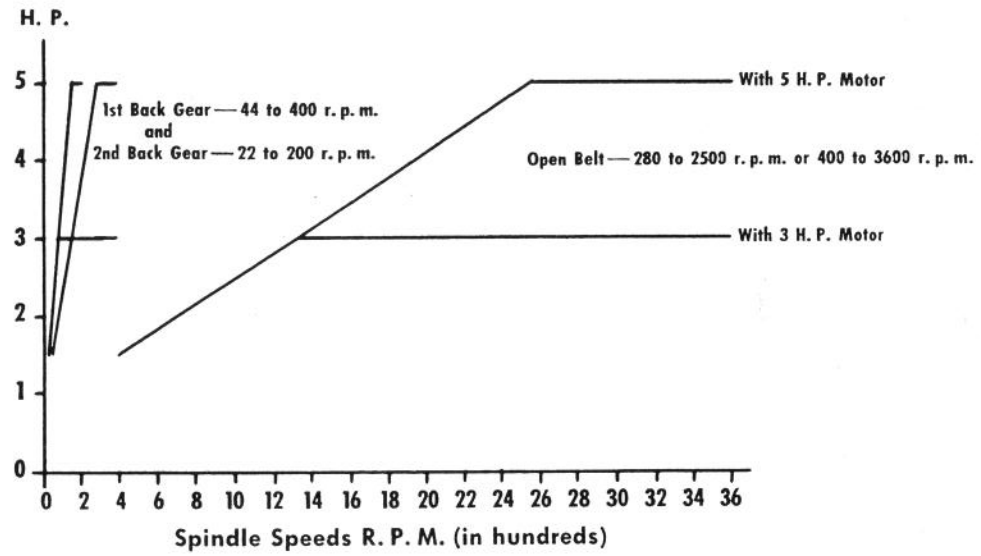
For small diameter pieces requiring high turning speeds, the spindle is driven by direct belt, free-running, with no gearing engaged, from 280 to 2500 r.p.m. or 400 to 3600 r.p.m.

Large diameters and work requiring heavy cuts are turned with spindle driven selectively through two sets of back gears. One set has 12½ to 1 reduction, driving the spindle from 22 to 200 r.p.m. The other has 6¼ to 1 reduction for speeds from 44 to 400 r.p.m. The driving vee belts retain their full efficiency as their running speed never drops below 300 feet per minute.

It has the swiftness for diamond turning and the strength for carbide.

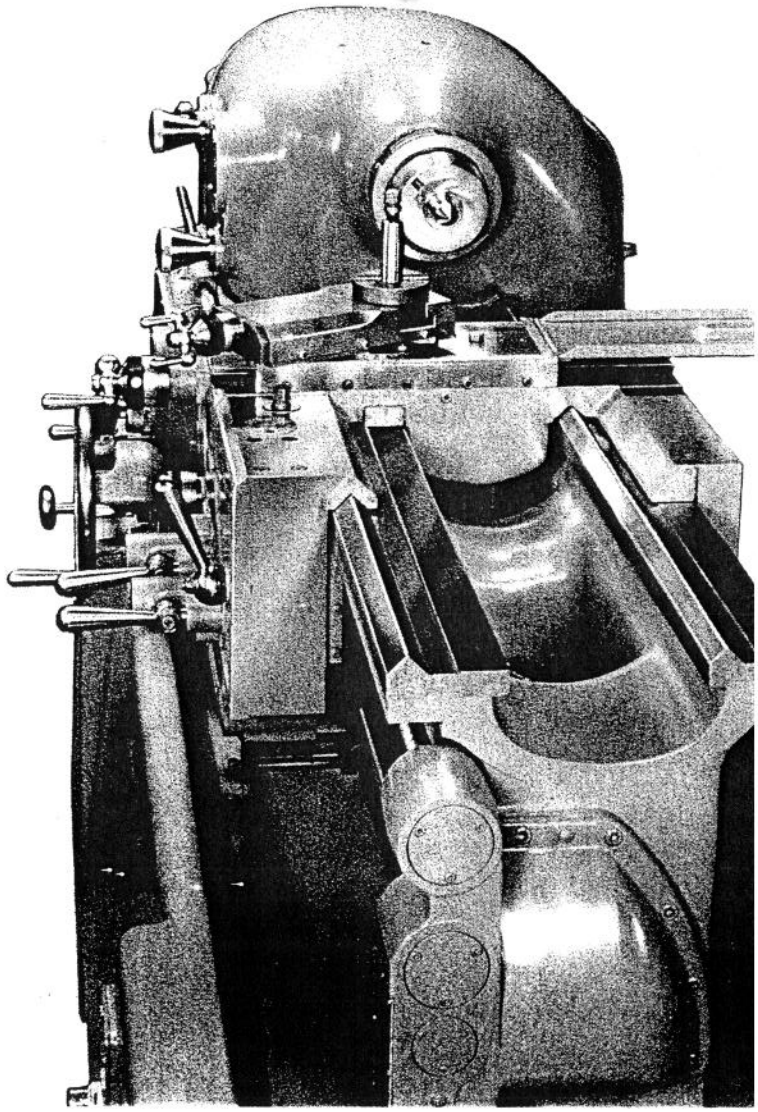
RIGIDITY AT THE CUTTING TOOL

HORSE POWER AVAILABLE AT THE SPINDLE


H. P.
5
4
3
2
1
0
1st Back Gear — 44 to 400 r. p. m.
and
2nd Back Gear — 22 to 200 r. p. m.
With 5 H. P. Motor
Open Belt — 280 to 2500 r. p. m. or 400 to 3600 r. p. m.
With 3 H. P. Motor
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
Spindle Speeds R. P. M. (in hundreds)

STEELWAY BED AND BASE

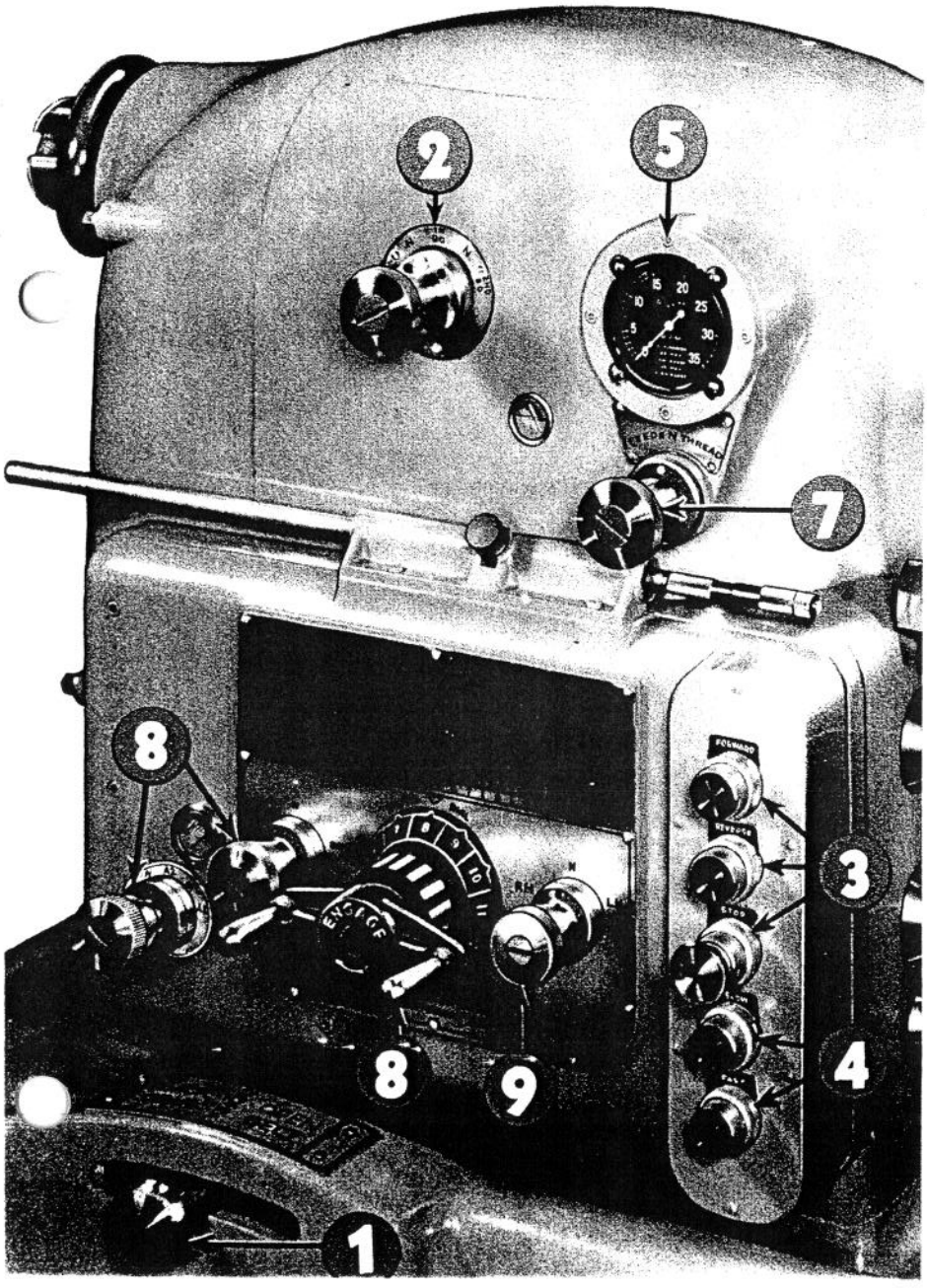
- The broad, heat-seasoned bed with its hardened and ground steelways is contrived for years and years of use. No unrelieved stress or soft slide area can endanger its original accuracy.
- Bedways 12¾″ in width support saddle under cutting load.
- Carriage saddle has 55½ square inches of bearing on the hardened steelways.
- Carriage and tailstock ride on separate flats and vees.
- Heavy cast base fully encloses drive and all electrical equipment. Yet both are instantly accessible.
- Base top has deep well for chip collection and coolant.



Simplified Controls

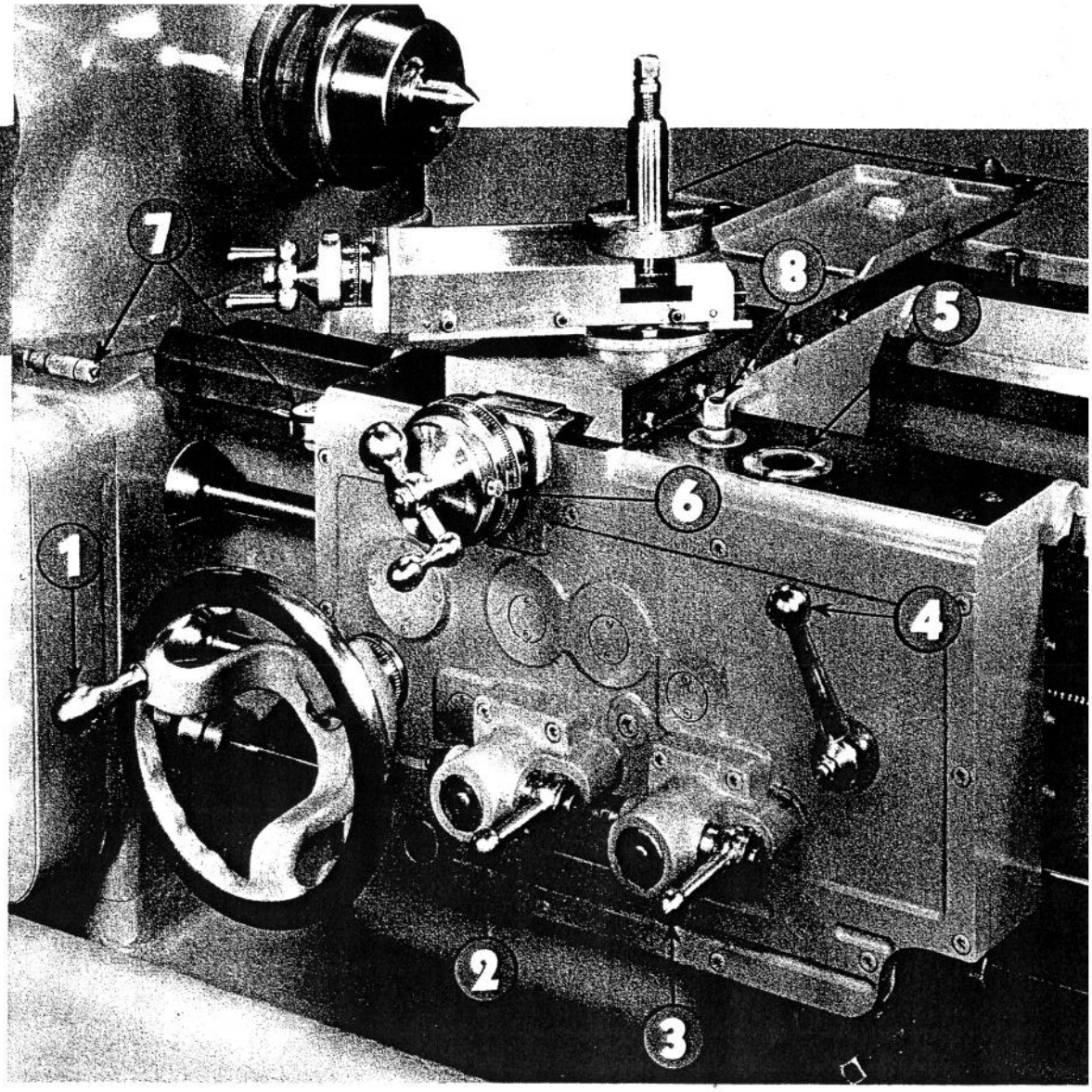
SAVE OPERATOR'S TIME

Simple means for setting-up and well-marked dials and handles assure top efficiency, measured in over-all machining time on the job in hand. The operator's convenience and comfort are assured by the functional grouping of all controls. Fatigue is avoided. Higher quality work and greater output result. Ten years of study, trial, error and change went into its creation.



HEADSTOCK SPINDLE CONTROLS

1. Lever selects drive to spindle by open belt or through back gears and is also used for bringing spindle to a coasting stop when desirable, without stopping main drive. Spindle is then free to roll by hand.
2. Knob sets up spindle drive by open belt, or through back gear trains.
3. Push buttons marked FORWARD, REVERSE and STOP govern main drive motor. Stop by automatic brake is instantaneous.
4. Push buttons marked FAST and SLOW set spindle speed within the open belt and back gear ranges.
5. Tachometer shows the r.p.m. by direct reading from the spindle.



CARRIAGE CONTROLS

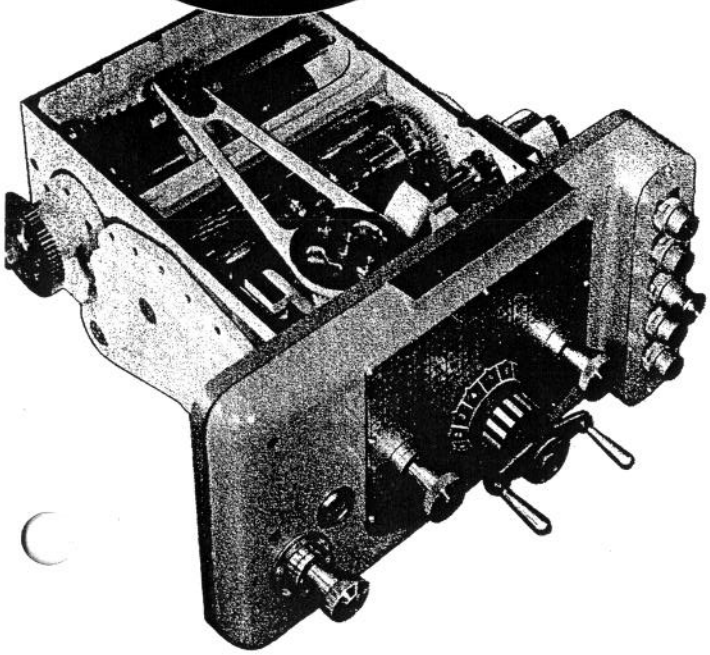
1. Handwheel moves carriage one inch per revolution graduated in sixty-fourths.
2. Lever operates clutch for power longitudinal feed. Operator may optionally move lever up or down to engage.
3. Lever operates clutch for power cross feed. Operator may optionally move lever up or down to engage.
4. Lever engages split nut with lead screw for threading.
5. Threading dial in immediate view of operator directs correct engagement of split nut.
6. Adjustable stop permits retracting and resetting threading tool without losing micrometer reading.
7. Carriage stop consists of precision dial indicator and adjustable rod with micrometer head.
8. Carriage clamp uses standard tool holder wrench.

GEAR BOX CONTROLS — See illustration on page 6

7. Knob engages drive from headstock to gear box and selects drive to carriage for threading or for power feed.
8. Knobs and selector dial set up desired thread or feed.
9. Knob sets up carriage drive for right-hand or left-hand threading or turning. Neutral position disconnects.

Unit Assemblies

REDUCE MAINTENANCE AND DOWN



Gear Box—built as an independent assembly—is installed within the bed enclosure.

Dials afford 72 feeds and 84 threads.

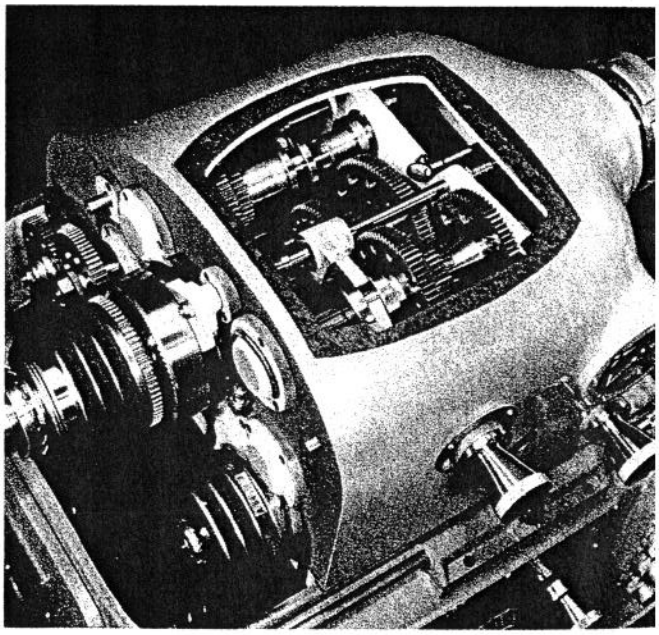
Thread range includes every world standard from 2 to 240 threads per inch.

Special or metric leads are conveniently set up with pick-off gears. Idlers run on grease-sealed bearings.

All gears are made of heat-treated alloy steel, shaved or ground.

All sliding gears move on six-tooth involute splined shafts.

All bearings are anti-friction.



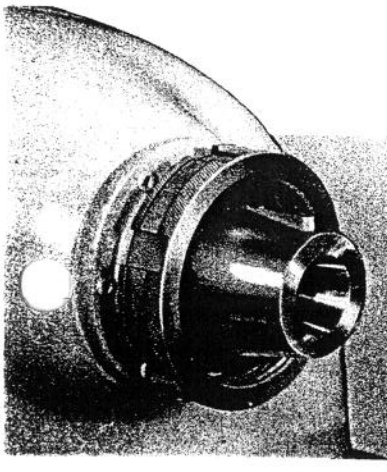
Headstock is a self-contained unit. All elements can be serviced through the top opening.

All gears are made of heat-treated alloy steel, shaved or ground.

All sliding gears move on six-tooth involute splined shafts.

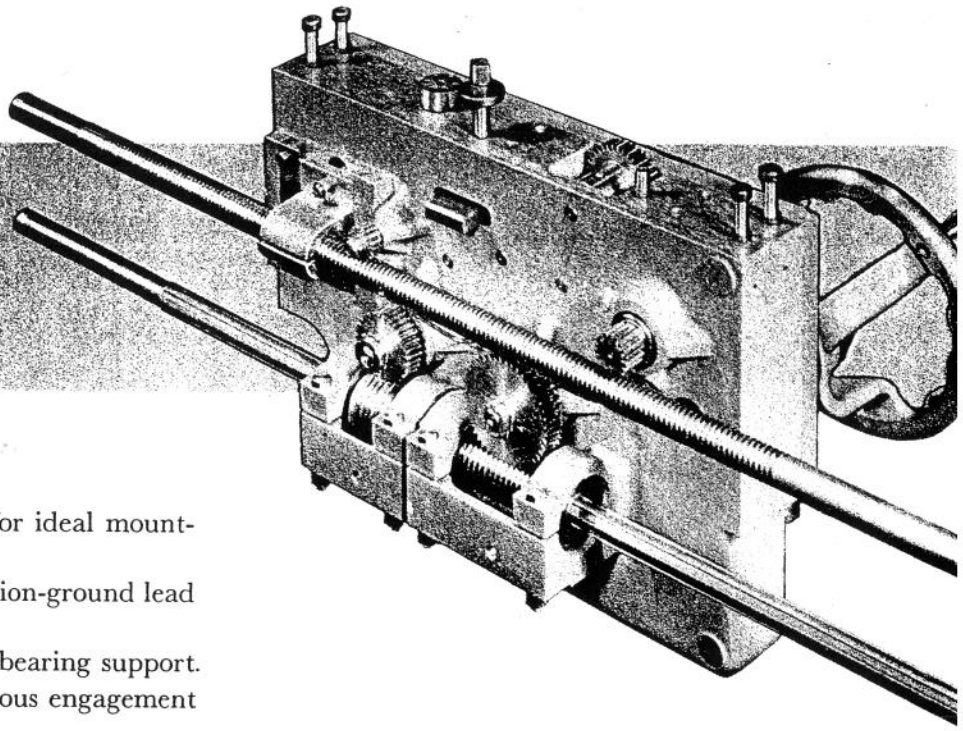
Spindle runs on super-precision ball bearings. Center bearing prevents deflection. There are no sliding gears on the spindle.

All bearings are anti-friction.



Long Taper Key-Drive Spindle Nose accurately and firmly mounts chucks, plates and fixtures. The long taper assures true running while the key provides positive drive in either direction. Rivett 6R collets mount directly in the spindle mouth for ultimate precision.

-TIME COSTS



Carriage Apron is double-walled for ideal mounting of all shafts.

Full bearing split nut engages precision-ground lead screw for threading.

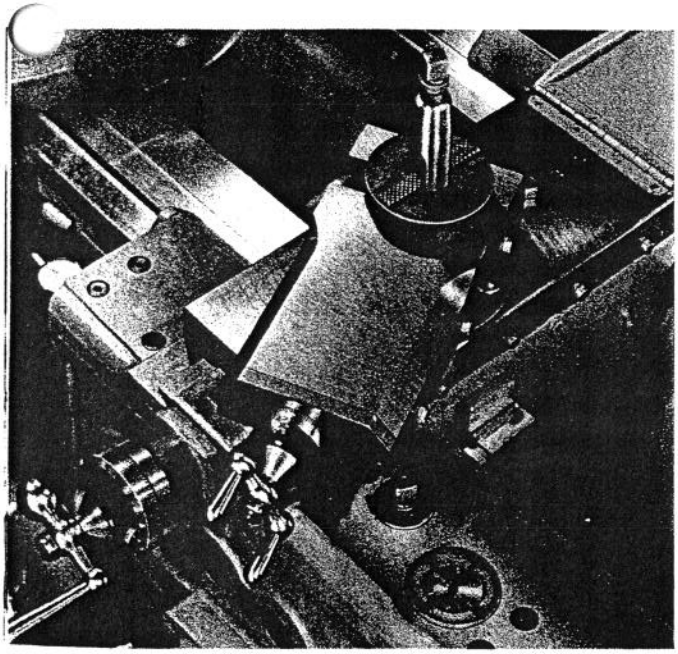
Multiple-splined feed rod has ball-bearing support.

Safety interlock prevents simultaneous engagement of lead screw and feed rod.

Cutting tool retracts from work if cross feed is engaged while longitudinal feed is operating forward.

Carriage clamp is centrally located to prevent deflection.

All bearings are anti-friction.



Compound and Cross Slide have generous bearing areas and full-length gibs with lock screws to maintain adjustment.

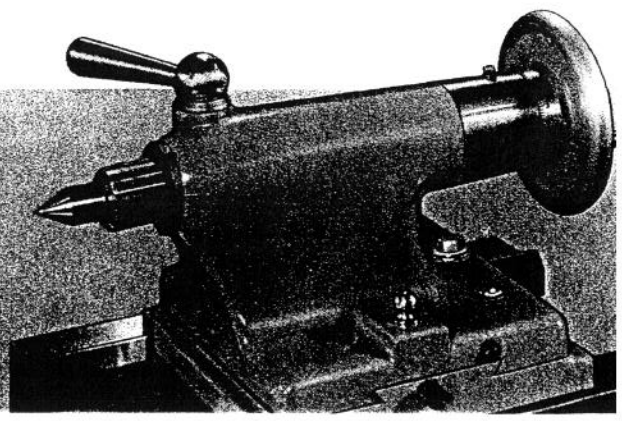
Feed screws are heat-treated steel, precision ground.

Feed screw nuts are adjustable to eliminate backlash.

Dials are large and clearly engraved to read in thousandths.

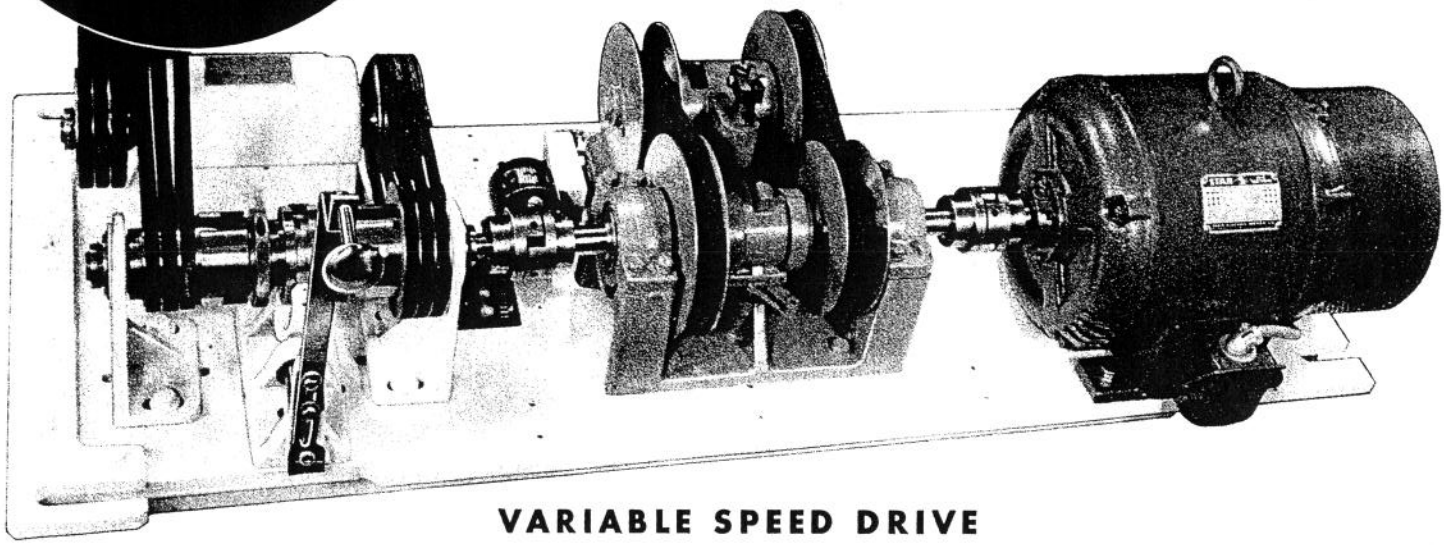
Compound swivel is graduated 180° either side of zero.

Cross slide feed screw has adjustable ball stop for retracting and resetting threading tool without loss of micrometer reading.



Tailstock has hardened spindle with full bearing in all positions. Travel is graduated by scale in sixteenths and by dial in thousandths. Drills are driven by an inside slot which does not break through wall. Screw ejects centers and drills. Frame may be offset by screw adjustment.

Push Button Drive with ELECTRICAL CARRIAGE CONTROL



VARIABLE SPEED DRIVE

A complete unit assembly, the drive is cushion mounted within the lathe base, easily accessible through panelled openings or removable through end door.

Push buttons control main drive motor FORWARD, REVERSE and STOP.

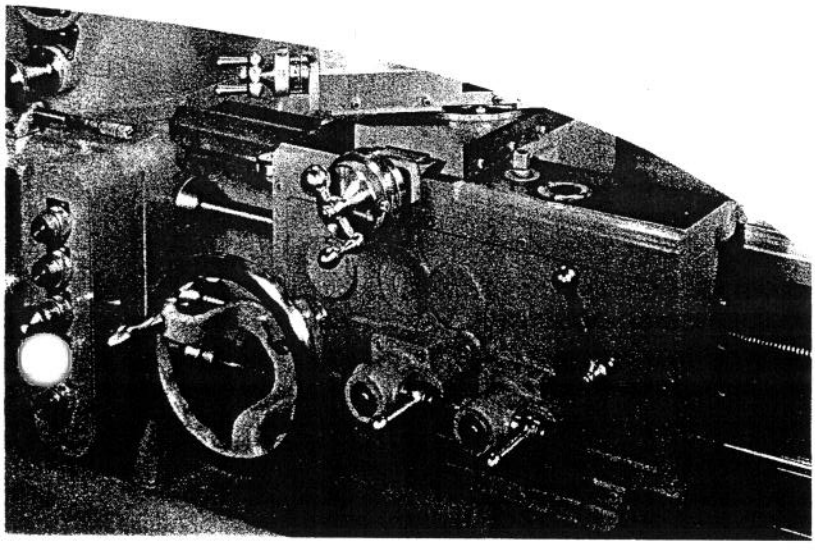
Push buttons marked FAST and SLOW operate a small independent motor to select desired spindle speed indicated by direct-reading tachometer on lathe headstock.

Power transmission from standard, constant-speed motor is by variable pitch vee-belt drive.

A selector clutch engages direct belt or back gear drive to the headstock spindle. Its neutral position stops the spindle without stopping the drive.

The standard 3 h.p. (or 5 h.p. when required) motor has a multiple disc brake for instant stopping.

Power to the lathe is transmitted by three matched vee belts. Irresistible torque of spindle is maintained as belt surface speed is never below 300 feet per minute. This essential factor is achieved by headstock back gears at low r.p.m.

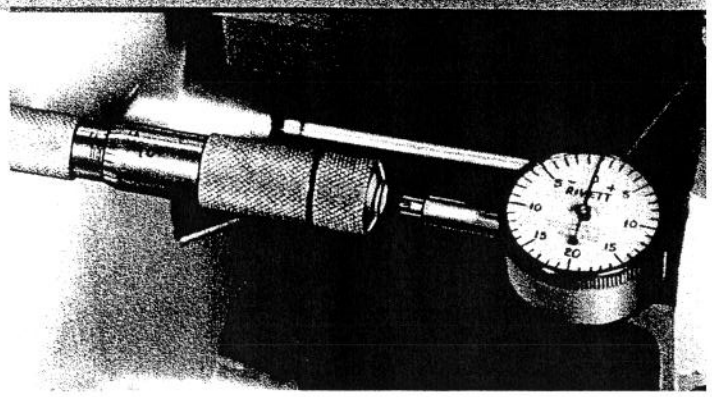


ELECTRICAL CARRIAGE CONTROL

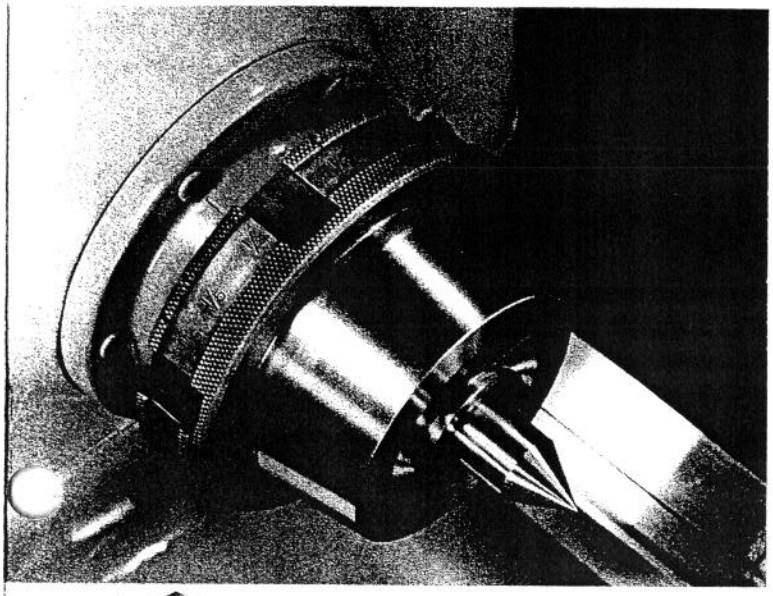
The electrical carriage control is an added accessory most valuable for chasing external or internal threads to limit the travel of carriage in either or both directions. Stops with screw adjustment simultaneously arrest the carriage and work rotation. The carriage travel is reversed by touching the convenient FORWARD or REVERSE push button. Perfect threads are assured as the lead screw nut is continuously engaged.

Standard Accessories

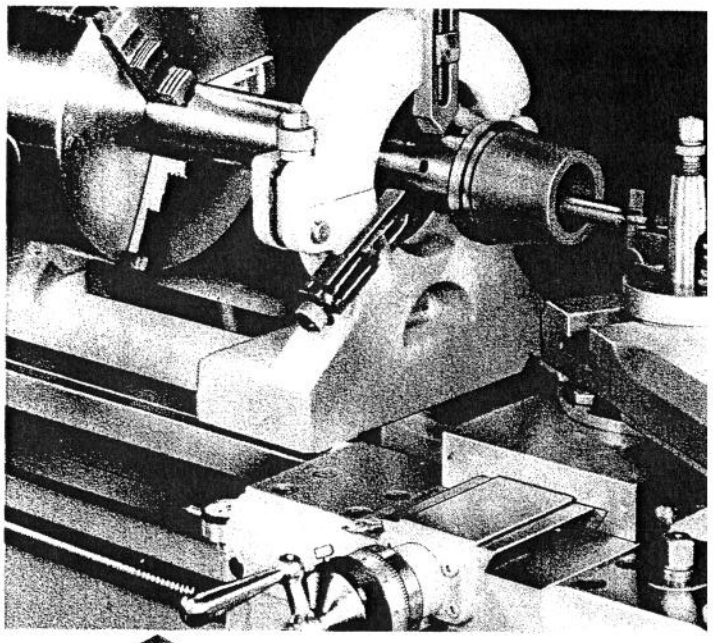
INCREASE PRODUCTION



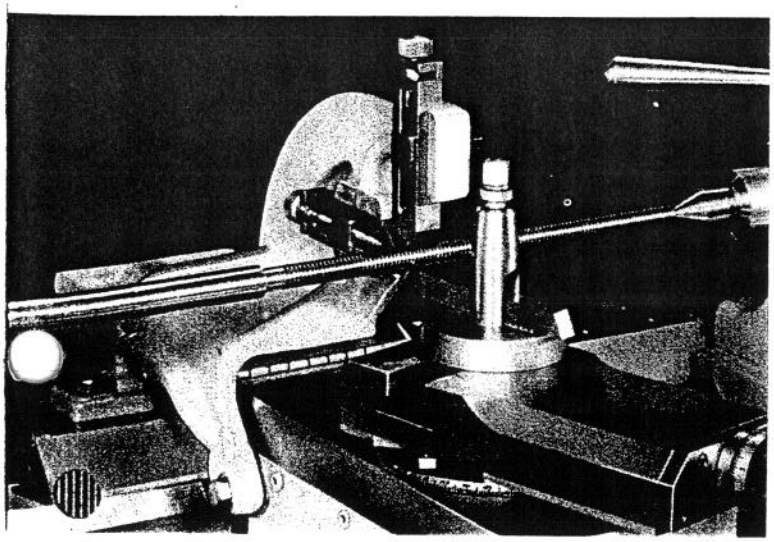
Carriage Dial Indicator Stop accurately locates carriage at any position on bed. The stop rod has a micrometer head which contacts the stem of a precision dial indicator.



Multiple Thread Indexing is accomplished with standard equipment. The nut on the LO type spindle nose is graduated for engaging the spindle gear to start 2, 3, 4, 5 or 6 threads.



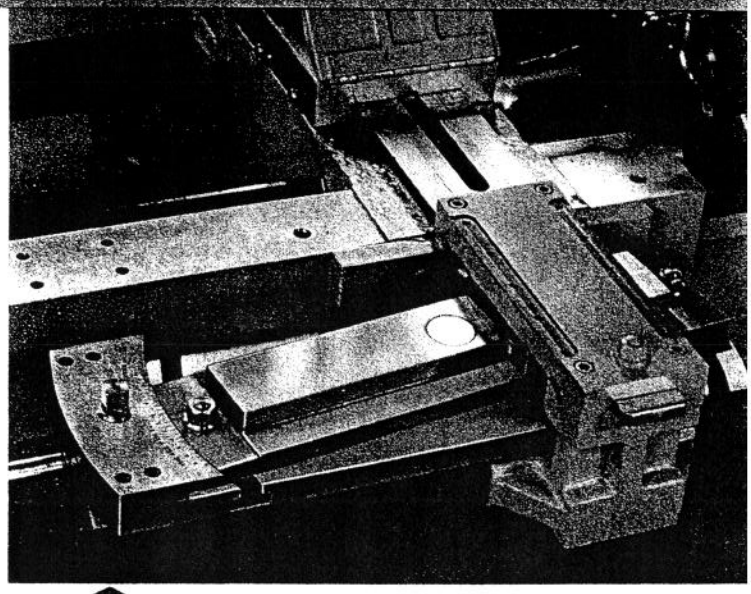
Steady Rest is hinged and has three adjustable jaws. Standard steady rest has 3″ diameter capacity. Steady rest with 6″ diameter capacity is available.



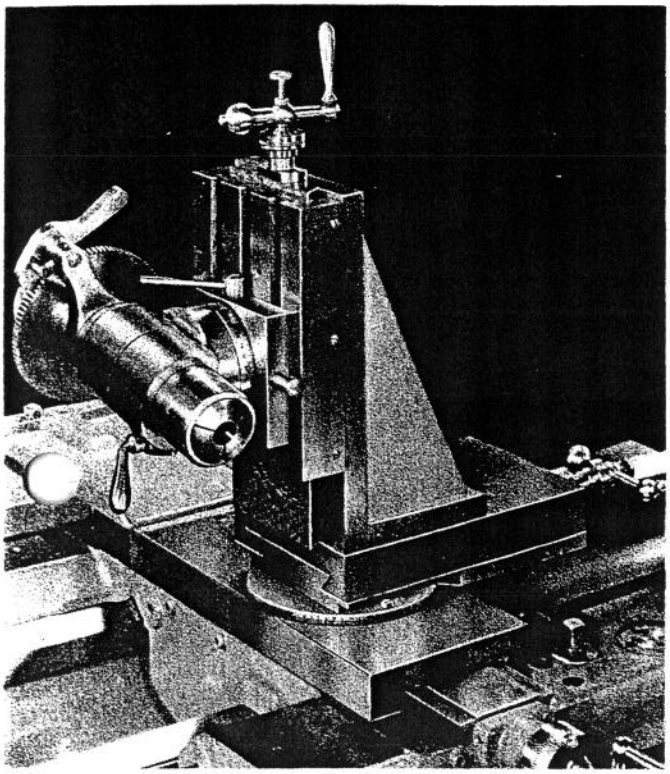
Follower Rest has two adjustable jaws to provide vertical and horizontal support for work up to 2″ diameter.

Added Accessories

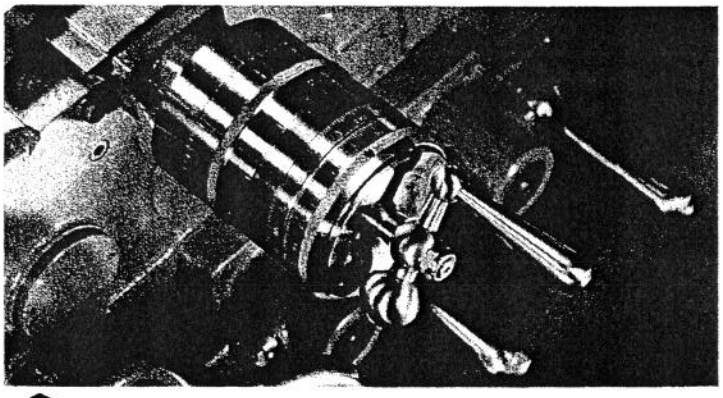
EXTEND MACHINING RANGE...



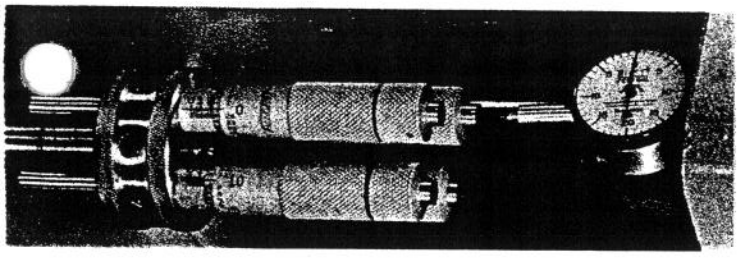
Taper Attachment may be used for turning tapers up to 18° included angle and 8″ length at one setting. The slide is set at desired angle by geared adjustment. The setting is measured by hairline graduations in both degrees and inches per foot. (Hinged guards for protecting the taper slide are removed in the above illustration.)



Universal Milling Attachment fits directly on bolt circle of cross slide and utilizes longitudinal and cross power feeds of carriage. Universal movements in three directions are graduated to .001″. Vertical and horizontal swivels are graduated in degrees. Face of vertical slide is slotted for mounting work or index head. Spindle of index head uses same Rivett 6R collets as are used in lathe spindle. See Bulletin 130.

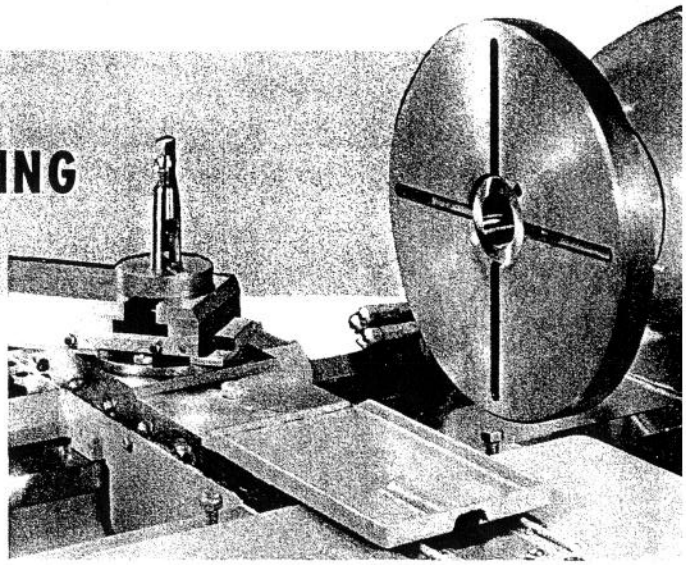


Accumulator Dial replaces standard cross feed dial. The outer dial, calibrated in thousandths of diameter, has separate numbering for turning and for boring. The inner dial accumulates and records the reading of the outer dial in hundreds of thousandths and in sixty-fourths.

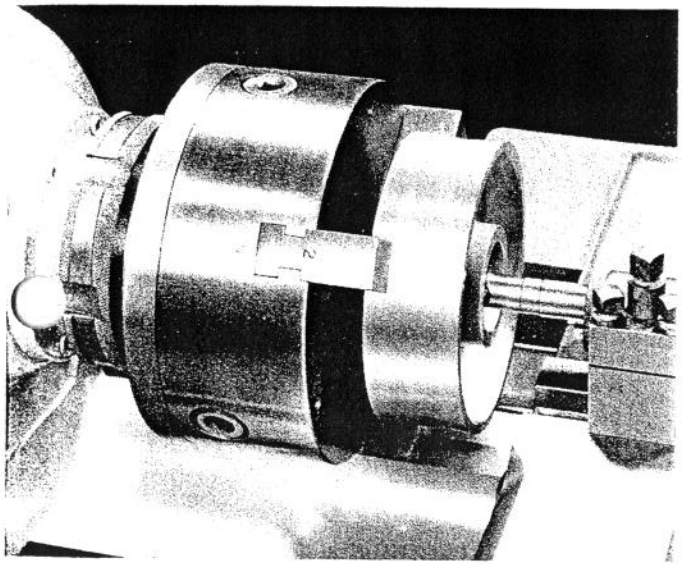


Multiple Carriage Positioning Stop mounts interchangeably with standard dial indicator stop. Any one of four adjustable micrometer heads can be indexed.

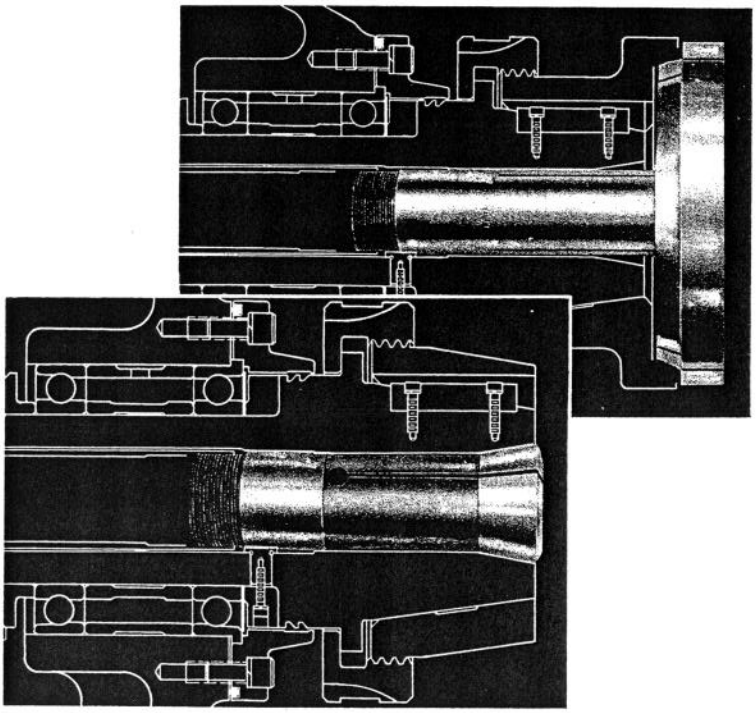
PROVIDE OPTIONAL WORK HOLDING



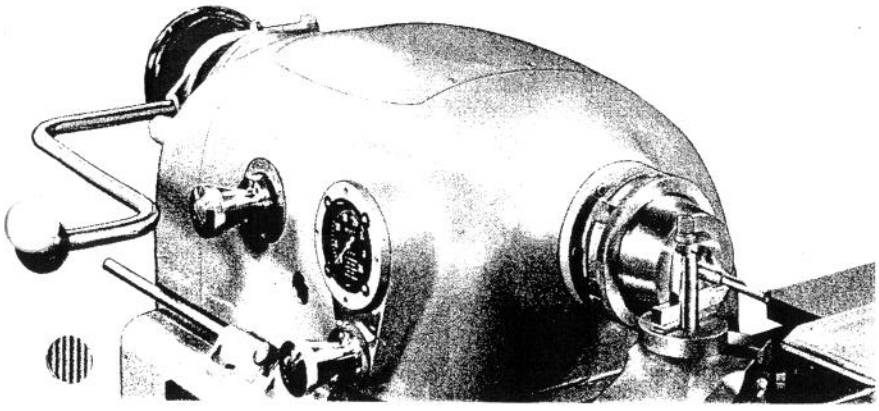
Slotted Face Plate has four tee slots for strapping and clamping odd shaped work. Diameter 12″.



Jaw Chucks with three universal jaws or four independent jaws are offered in 6″ and 8″ sizes.

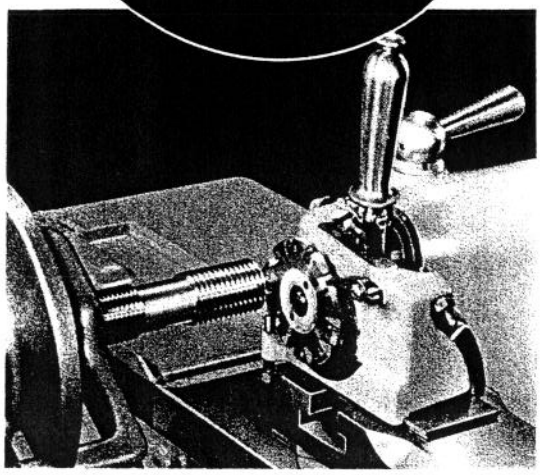


Draw-in Collets and Step Chucks mount directly in spindle mouth (without adapters) and run true. Step chucks above 2″ capacity use closing rings.



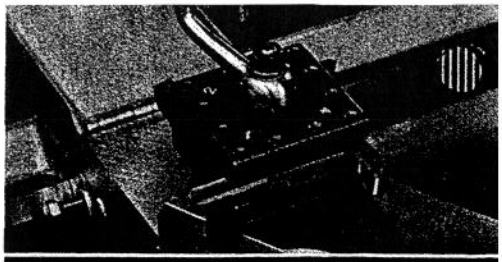
Lever Chuck Closer used with collets and step chucks greatly reduces chucking time on duplicate parts. Handwheel is convenient when setting up and gauging work.

for Specialized Tooling

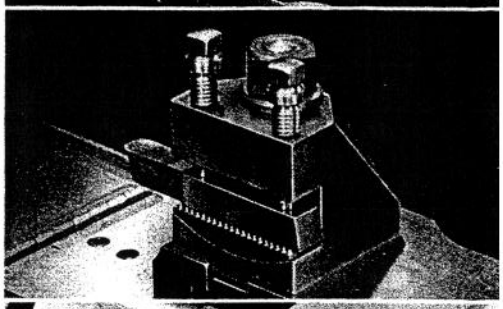


Thread Tool replaces single-point threading tool, carries a 10-tooth cutter and indexes each of its teeth successively to the work. Ten even cuts generate a perfect thread. (For detailed information request Bulletin 110.)

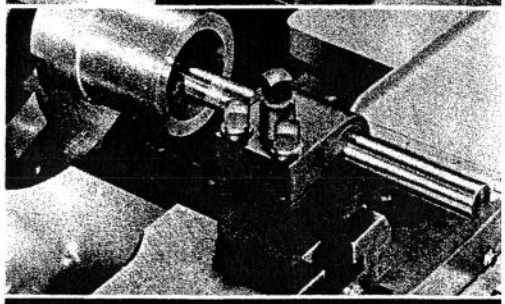
Turret Tool Post fitting directly on compound carries four tools ½″ square and indexes to twelve positions.

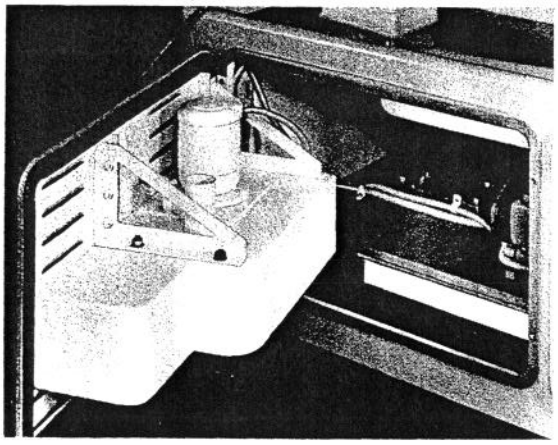


Side Mounting Tool Block has rocker for tool height adjustment. Maximum tool sizes, ⅝″ square.

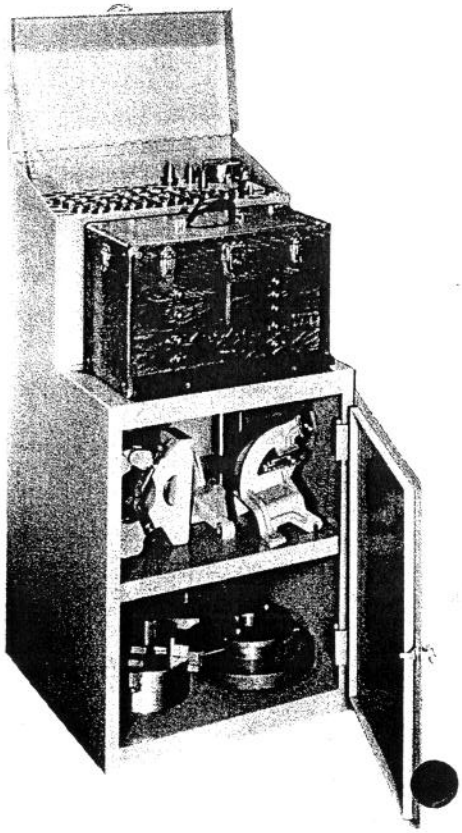


Eccentric Tool Holder mounts ¾″ or ½″ dia. boring bar, straight cutter holder or angle cutter holder. Rotation of eccentric sleeve adjusts tool height. Square tool bits and round tools can be used with sleeves — rotation gives proper rake and clearance angle.



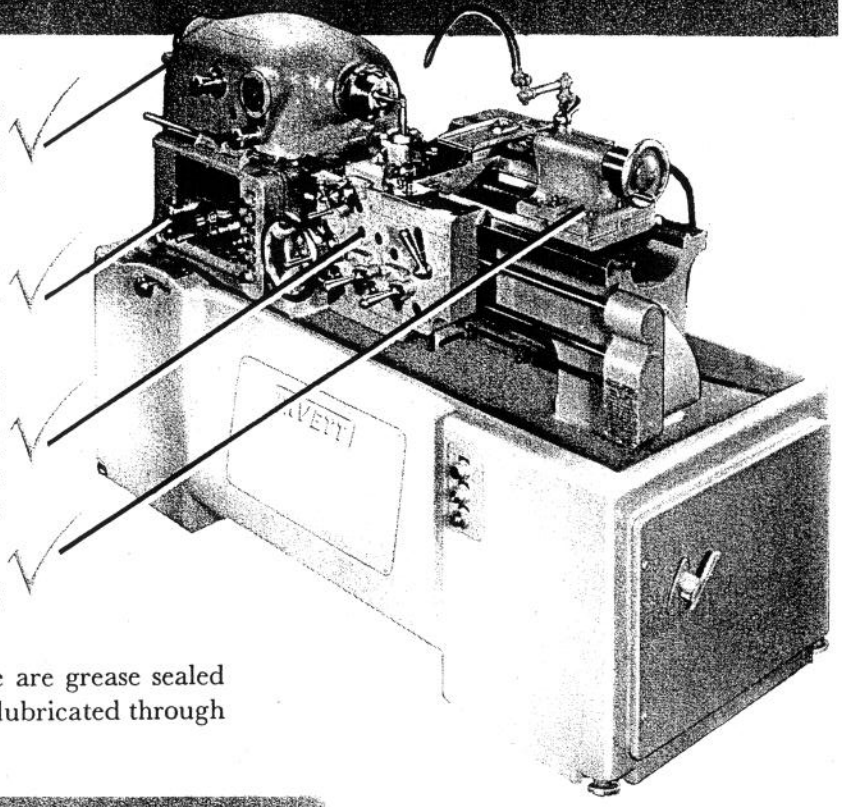


Coolant Pump—A unit motor-driven immersion pump and 6-gallon reservoir attach to hinged door at rear of base. Flexible metal gooseneck with nozzle and shut-off attaches to carriage saddle and moves with cutting tool.



Floor Cabinet provides orderly storage for standard equipment, collets and special accessories.

Automatic Lubrication... POSITIVE and RELIABLE



Headstock bearings, gears and splined shafts are splash lubricated. Spindle bearings are assured a continuous film of oil. Sight gauge indicates proper level.

Gear Box has its own ample oil supply. Bearings, gears and splined shafts are splash lubricated. Sight glass at front indicates proper level.

Carriage and Bedways are lubricated by a plunger pump operating off the power feed mechanism. Oil is drawn from a reservoir and metered to the bearings, gears, cross slide ways and bedways. Gauge glass indicates oil level in reservoir.

Tailstock has two oil reservoirs for lubricating spindle and bedways.

Drive bearings of anti-friction type are grease sealed for life. Bronze slide bearings are lubricated through grease gun fittings.

SPECIFICATIONS

GENERAL

Distance between centers with tailstock flush	20"
Swing over bed, dia.	12½"
Swing over carriage, dia.	7¼"
Height, work centers from floor	43"
Floor space	29" x 73"
Automatic lubrication.	

HEADSTOCK

Long taper key-drive spindle nose (standard)	ASA No. LO
Draw-in collet mounted directly in spindle, max. dia.	1⅛"
Step chuck mounted directly in spindle, max. dia.	6"
Hole through spindle, max. dia.	1¼"
Camlock spindle nose (optional)	ASA 4" D-1
Draw-collet used with Sjogren collet chuck, max. dia.	1⅜"
Jacobs rubber-flex collet used with collet chuck, max. dia.	1⅜"
Hole through spindle, max. dia.	1⅜"

TAILSTOCK

Travel of tailstock spindle	3½"
Dia. of tailstock spindle	1⅝"
Taper of hole	Morse No. 3
Scale graduations	3½" by 16ths
Dial graduations	.001"
Offset adjustment	½"

GEAR BOX

Number of feed changes	72
Feed range through gear box	.001" to .060"
Number of thread changes	84
Thread range through gear box	2 to 240

Actual threads through gear box: 2, 2¼, 2⅜, 2½, 2¾, 2⅞, 3, 3⅛, 3¼, 3⅜, 3½, 3¾, 4, 4½, 4¾, 5, 5½, 5¾, 6, 6¼, 6½, 6¾, 7, 7½, 8, 9, 9½, 10, 11, 11½, 12, 12½, 13, 13½, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 32, 36, 38, 40, 44, 46, 48, 50, 52, 54, 56, 60, 64, 72, 76, 80, 88, 92, 96, 100, 104, 108, 112, 120. Following threads are cut by setting knob No. 7, page 7, at "Feed" which doubles pitch of the twelve previous threads: 128, 144, 152, 160, 176, 184, 192, 200, 208, 216, 224, 240.

BED

Width	12¾"
Depth	9"

CARRIAGE AND COMPOUND

Carriage travel	20"
Length of carriage bed bearing	17¾"
Carriage bridge width	5"
Carriage saddle bearing on bedways	55½ sq. in.
Cross slide travel	7¼"
Compound slide travel	2"
Dial graduations	.001"
Size of lathe tool	⅜" x ⅞"

MOTOR

Size (standard)	1750 r.p.m., 3 h.p.
Size (special)	1750 r.p.m., 5 h.p.

SPINDLE SPEEDS

Range No. 1 —	infinite through back gears	22 to 400 r.p.m.
	infinite by direct belting	280 to 2500 r.p.m.
Range No. 2 —	infinite through back gears	22 to 400 r.p.m.
	infinite by direct belting	400 to 3600 r.p.m.

TAPER ATTACHMENT

Max. length of taper	8"
Max. included angle in degrees	18°
Max. taper inches per foot	3½"

FOLLOWER REST

Max. opening	2¼"

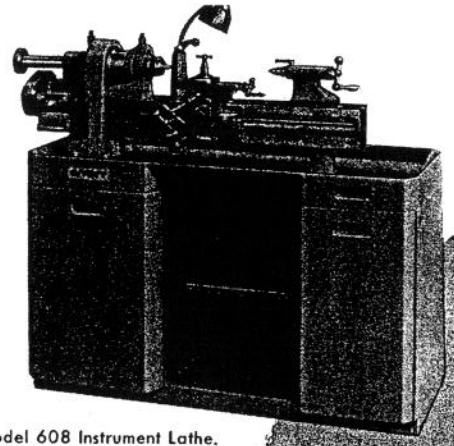
STEADY REST

Max. opening (standard)	3"
Max. opening (special)	6"

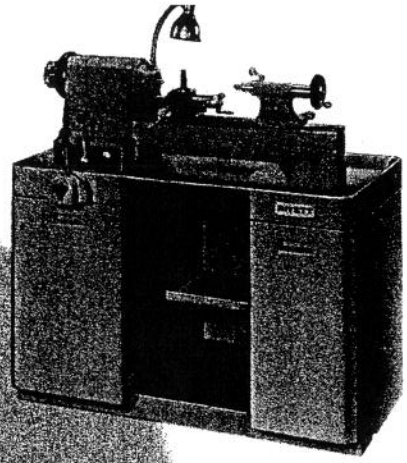
SHIPPING INFORMATION

Net weight with motor and standard equipment	3900 lbs.
Crated for domestic shipment	4500 lbs.
Boxed for export shipment	4900 lbs.
Cubic feet, boxed for export shipment	130

STANDARD EQUIPMENT — driving plate, hard male center with center chuck, screw draw-in spindle for collets, spindle handwheel, spindle speed tachometer, dial indicator stop for carriage, compound rest, tool post, threading dial, quick threading stop, follower rest, steady rest, hard male center for tailstock, mechanical variable speed drive, 3 h.p. brake-motor, magnetic controller, disconnect switch and wrenches.



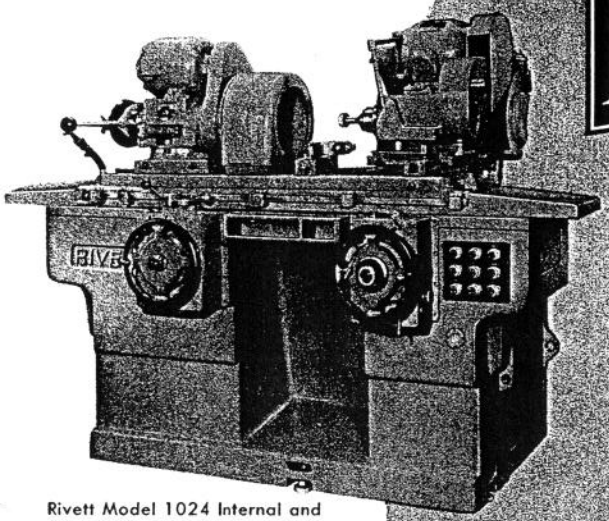
Rivett Model 608 Instrument Lathe. 8½" swing, 18¼" between centers, 1" collet capacity. *Write for Bulletin 608.*



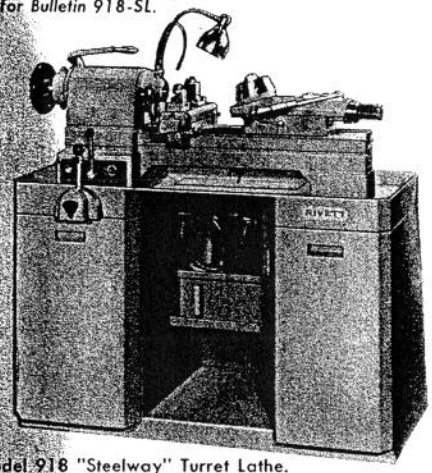
Rivett Model 918 "Steelway" Cabinet Lathe. 9" swing, 18" between centers, 1⅛" draw-in, or 15/16" stationary collet capacity. *Write for Bulletin 918-SL.*

RIVETT

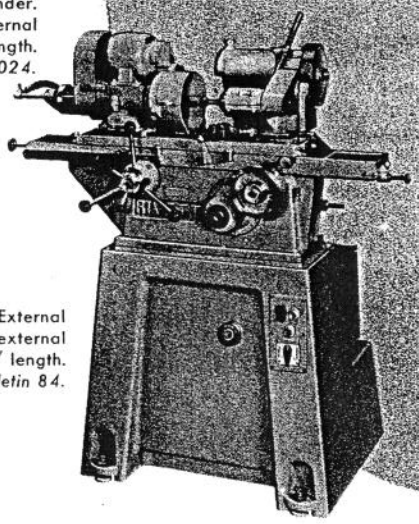
A SYMBOL OF ACCURACY IN MACHINE TOOLS



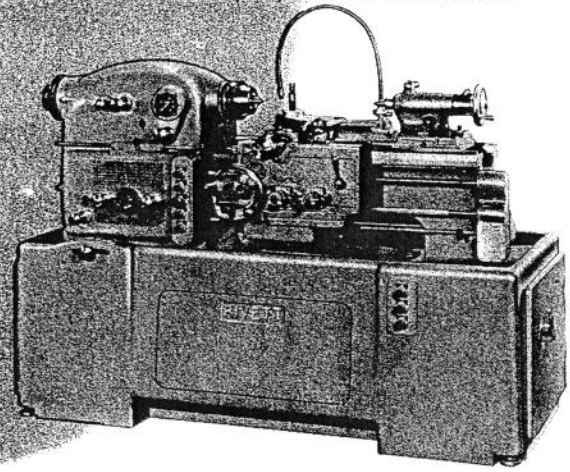
Rivett Model 1024 Internal and Universal Hydraulic Grinder. Hole grinding ⅛" to 9" dia.; external grinding to 12" dia. up to 21" length. *Write for Bulletin 1024.*



Rivett Model 918 "Steelway" Turret Lathe. 9" swing, 20" between collet and turret face, 1⅛" draw-in, or 15/16" stationary collet capacity. *Write for Bulletin 918-ST.*

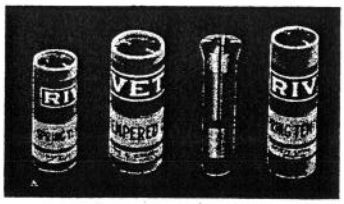


Rivett Model 84 Internal-External Grinder. Hole grinding and, or, external grinding up to 3" dia. and up to 4" length. *Write for Bulletin 84.*

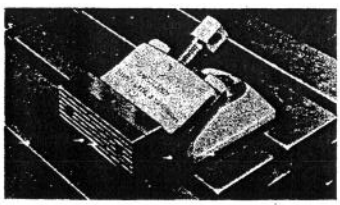


Rivett Model 1020S Precision Toolroom Lathe. 12½" swing, 20" between centers, 1⅛" draw-in collet capacity. *Write for Bulletin 1020.*

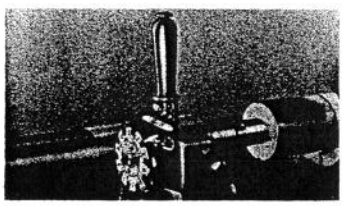
RIVETT ACCESSORIES



DRAW-IN COLLETS—are made in many standard and special styles for lathes, millers, grinders, etc. Carried in stock.
Write for Bulletin 100



LOCKJAW—all purpose work clamps furnished in several sizes for planers, shapers, millers, etc. Eliminates expensive clamping and bolting.
Write for Bulletin 140



THREAD TOOL—used on any screw-cutting lathe, and takes the place of single point threading tools. Ten teeth of a cutter are progressively indexed to form a perfect finished thread.
Write for Bulletin 110